

### IN THE UNITED STATES PATENT AND TRADE MARK OFFICE

OUR FILE NO. : 1004P60US01

SERIAL NO. : 10/600,345

FILED : 23 Jun 2003

APPLICANT : Edward J. ANTHONY et al..

GROUP ART UNIT: Unknown

TITLE : Regeneration of Calcium Oxide or Calcium Carbonate

From Waste Calcium Sulphide

## INFORMATION DISCLOSURE STATEMENT

Under 37 C.F.R. 1.97

U.S.Patent and Trademark Office 2011 South Clark Place Customer Window Crystal Plaza Two, Lobby, Room 1B03 Arlington, Virginia 22202 U.S.A.

Sir:

Under the provisions of 37 C.F.R. 1.97, including particularly subsections (a) and (e) thereof, and 37 C.F.R. 1.98 including specifically subsection (a) thereof, Applicant calls to the attention of the Examiner the following documents, copies of which are enclosed:

#### U.S. PATENT DOCUMENTS

AA US 3,688,438

AB US 3,709,669

AC US 3,922,148

AD US 3,944,486

AE US 4,102,989

AF US 4,216,197

AG US 4,262,610

AH US 4,321,242

- AI US 4,370,161
- AJ US 4,410,336
- AK US 4,424,197
- AL US 4,435,148
- AM US 4,503,785
- AN US 4,602,573
- AO US 4,609,541
- AP US 4,624,192
- AQ US 4,635,572
- AR US 4,686,090
- AS US 4,704,136
- AT US 4,722,832
- AU US 4,738,207
- AV US 4,913,068
- AW US 5,027,723
- AX US 5,228,399
- AY US 5,396,849
- AZ US 5,551,357
- AAA US 5,653,955
- AAB US 5,662,051
- AAC US 6,083,862

### NON PATENT LITERATURE DOCUMENTS

- BA The British Coal Spouted Fluidized Bed Gasification Process.

  The Canadian Journal of Chemical Engineering, Volume 70,
  October, 1992, 991-997
- BB The Rate and the Fundamental Mechanisms of the Reaction of Hydrogen Sulfide with the Basic Minerals in Coal. *Ind. Eng. Chem. Process Des. Dev.* 1979, 18, 607-618
- BC Reaction of  $H_2S$  and Sulfur with Limestone Particles. Ind. Eng. Chem. Process Des. Dev. 1984, 23, 742-748
- BD The Sulphidation of Calcined Limestone with Hydrogen Sulphide and Carbonyl Sulphide. Chem. Eng. Sci. 1995, 50, 2983-2996

BE Regeneration of Calcium Sulfide under Alternating Oxidizing and Inert Conditions: Kinetics and Mechanism. *Ind. Eng. Chem. Res.* 1998, 37, 923-928

BF Regeneration of Sulfided Calcium-Based Sorbents by a Cyclic Process. Energy & Fuels. 1996, 10, 821-827

BG CaS Oxidation by Reaction with  $CO_2$  and  $H_2O$ . E.J. Anthony, L. Jia and K. Qiu, CETC, Natural Resources Canada, 1, Haanel Dr., Ottawa, Canada KIA 1M1

Applicant respectfully requests that these references be entered into the record of this application. The Examiner is requested to initial the appropriate area on the enclosed copies of PTO/SB/08A and PTO/SB/08B, thereby indicating consideration by the Examiner of each of these references.

Applicant respectfully submits that the present claims are patentable over the references identified herein, and requests timely and favourable examination of this application.

The Commissioner is hereby authorized to debit any underpayment or credit any overpayment to the USPTO deposit account no. 16-0600 should any additional fees be necessary.

Respectfully submitted,

Dennis R. Haszko Reg. No. 39,575

20 October 2003

#### SHAPIRO COHEN

112 Kent Street, Suite 2001 P.O. Box 3440, Stn. D Ottawa, ON CANADA K1P 6P1 (613) 232-5300

DRH:ds/Enclosures

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Sheet

# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

of

C mplete if Kn wn

Application Number 10/600,345

Filing Date 23 Jun 2003

First Named Inventor Anthony, E.J. et al.

Art Unit Unknown

Examiner Name Unknown

Attorney Docket Number 1004P60US01

|                       |                          |  | U. S. PATENT                | DOCUMENTS  |   |
|-----------------------|--------------------------|--|-----------------------------|--|---|
| Examiner<br>Initials* | Cite<br>No. <sup>1</sup> | Document Number  Number-Kind Code <sup>2 (# known)</sup> | Publication Date MM-DD-YYYY | Name of Patentee or<br>Applicant of Cited Document | Pages, Columns, Lines, Where<br>Relevant Passages or Relevant<br>Figures Appear |
|                       | AA                       | US- 3,688,438  | 09-05-1972                  | Slater et al.                                      |   |
|                       | AB                       | <sup>US-</sup> 3,709,669                                 | 01-09-1973                  | Marion et al.                                      | <del>-</del>  |
|                       | AC                       | <sup>US-</sup> 3,922,148                                 | 11-25-1975                  | Child  |   |
|                       | AD                       | <sup>US-</sup> 3,944,486                                 | 03-16-1976                  | Kwon   |   |
|                       | AE                       | <sup>US-</sup> 4,102,989                                 | 07-25-1978                  | Wheelock   |   |
|                       | AF                       | <sup>US-</sup> 4,216,197                                 | 08-05-1980                  | Moss   |   |
|                       | AG                       | <sup>US-</sup> 4,262,610                                 | 04-21-1981                  | Hein et al.  |   |
|                       | AH                       | <sup>US-</sup> 4,321,242                                 | 03-23-1982                  | Feinman et al.                                     |   |
|                       | Al                       | <sup>US-</sup> 4,370,161                                 | 01-25-1983                  | Turkdogan  |   |
|                       | AJ                       | <sup>US-</sup> 4,410,336                                 | 10-18-1983                  | Blaskowski   |   |
|                       | AK                       | <sup>US-</sup> 4,424,197                                 | 01-03-1984                  | Powell et al.                                      |   |
|                       | AL                       | <sup>US-</sup> 4,435,148                                 | 03-06-1984                  | Moss   |   |
|                       | AM                       | <sup>US-</sup> 4,503,785                                 | 03-12-1985                  | Scocca   |   |
|                       | AN                       | <sup>US-</sup> 4,602,573                                 | 07-29-1986                  | Tanca  |   |
|                       | AO                       | <sup>US-</sup> 4,609,541                                 | 09-02-1986                  | Calderon   |   |
|                       | AP                       | <sup>US-</sup> 4,624,192                                 | 11-25-1986                  | Mansfield  |   |
|                       | AQ                       | <sup>US-</sup> 4,635,572                                 | 01-13-1987                  | Nickel   |   |
|                       | AR                       | <sup>US-</sup> 4,686,090                                 | 08-11-1987                  | Howell et al.                                      |   |
|                       | AS                       | <sup>US-</sup> 4,704,136                                 | 11-03-1987                  | Weston et al.                                      |   |

|  | FOREIGN PATENT DOCUMENTS |   |                     |  |   |                |
|--|--------------------------|---|---------------------|--|---|----------------|
| Examiner Initials*                     | Cite<br>No.1             | Foreign Patent Document   | Publication<br>Date | Name of Patentee or<br>Applicant of Cited Document | Pages, Columns, Lines,<br>Where Relevant Passages |                |
|  |                          | Country Code <sup>3</sup> Number <sup>4</sup> Kind Code <sup>5</sup> (if known) | MM-DD-YYYY          | .,   | Or Relevant Figures Appear                        | T <sup>6</sup> |
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| Examiner  | Date       |  |
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| Signature | Considered |  |
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\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. <sup>1</sup>Applicant's unique citation designation number (optional). <sup>2</sup>See Kinds Codes of USPTO Patent Documents at <a href="www.uspto.gov">www.uspto.gov</a> or MPEP 901.04. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup>Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>6</sup>Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 2 of 3 Attorney Docket Number 1004P60L

| C mplete if Known      |                      |  |  |
|------------------------|----------------------|--|--|
| Application Number     | 10/600,345           |  |  |
| Filing Date            | 23 Jun 2003          |  |  |
| First Named Inventor   | Anthony, E.J. et al. |  |  |
| Art Unit               | Unknown              |  |  |
| Examiner Name          | Unknown              |  |  |
| Attorney Docket Number | 1004P60US01          |  |  |

|                       |                          |  | U. S. PATENT                | T DOCUMENTS  |  |
|-----------------------|--------------------------|--|-----------------------------|--|--|
| Examiner<br>Initials* | Cite<br>No. <sup>1</sup> | Document Number  Number-Kind Code <sup>2</sup> (* known) | Publication Date MM-DD-YYYY | Name of Patentee or<br>Applicant of Cited Document | Pages, Columns, Lines, Where<br>Relevant Passages or Relevan<br>Figures Appear |
|                       | AT                       | <sup>US-</sup> 4,722,832                                 | 02-02-1988                  | Weston et al.                                      |  |
|                       | AU                       | <sup>US-</sup> 4,738,207                                 | 04-19-1988                  | Moss   |  |
|                       | AV                       | <sup>US-</sup> 4,913,068                                 | 04-03-1990                  | Brannstrom   |  |
|                       | AW                       | <sup>US-</sup> 5,027,723                                 | 07-02-1991                  | Landreth et al.                                    |  |
|                       | AX                       | <sup>US-</sup> 5,228,399                                 | 07-20-1993                  | Weathery   |  |
|                       | AY                       | <sup>US-</sup> 5,396,849                                 | 03-14-1995                  | Boyd   |  |
|                       | AZ                       | <sup>US-</sup> 5,551,357                                 | 09-03-1996                  | Wu et al.  |  |
|                       | AAA                      | <sup>US-</sup> 5,653,955                                 | 08-05-1997                  | Wheelock   |  |
|                       | AAB                      | <sup>US-</sup> 5,662,051                                 | 09-02-1997                  | Morin  |  |
|                       | AAC                      | <sup>US-</sup> 6,083,862                                 | 07-04-2000                  | Wheelock   |  |
|                       |                          | US-  |                             |  |  |

|                       | FOREIGN PATENT DOCUMENTS |  |                                   |  |   |                |  |
|-----------------------|--------------------------|--|-----------------------------------|--|---|----------------|--|
| Examiner<br>Initials* | Cite<br>No. <sup>1</sup> | Foreign Patent Document  Country Code <sup>3</sup> Number <sup>4</sup> Kind Code <sup>5</sup> (if known) | Publication<br>Date<br>MM-DD-YYYY | Name of Patentee or<br>Applicant of Cited Document | Pages, Columns, Lines,<br>Where Relevant Passages<br>Or Relevant Figures Appear | Т <sup>6</sup> |  |
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STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 3 3 of

| Complete if Known      |                      |  |  |
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| Art Unit               | Unknown              |  |  |
| Examiner Name          | Unknown              |  |  |
| Attorney Docket Number | 1004P60US01          |  |  |

|                       |                          | NON PATENT LITERATURE DOCUMENTS   |                |
|-----------------------|--------------------------|---|----------------|
| Examiner<br>Initials* | Cite<br>No. <sup>1</sup> | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published. | T <sup>2</sup> |
|                       | ВА                       | The British Coal Spouted Fluidized Bed Gasification Process. The Canadian Journal of Chemical Engineering, Volume 70, October, 1992, 991-997  |                |
|                       | ВВ                       | The Rate and the Fundamental Mechanisms of the Reaction of Hydrogen Sulfide with the Basic Minerals in Coal. Ind. Eng. Chem. Process Des. Dev. 1979, 18, 607-618  |                |
|                       | вс                       | Reaction of H2S and Sulfur with Limestone Particles. Ind. Eng. Chem. Process Des. Dev. 1984, 23, 742-748  |                |
|                       | BD                       | The Sulphidation of Calcined Limestone with Hydrogen Sulphide and Carbonyl Sulphide. Chem. Eng. Sci. 1995, 50, 2983-2996  |                |
|                       | BE                       | Regeneration of Calcium Sulfide under Alternating Oxidizing and Inert Conditions: Kinetics and Mechanism. Ind. Eng. Chem. Res. 1998, 37, 923-928  |                |
|                       | BF                       | Regeneration of Sulfided Calcium-Based Sorbents by a Cyclic Process. Energy & Fuels. 1996, 10, 821-827  |                |
|                       | BG                       | CaS Oxidation by Reaction with CO2 and H2O. E.J. Anthony, L. Jia and K. Qiu, CETC, Natural Resources Canada, 1, Haanel Dr., Ottawa, Canada K1A 1M1  |                |
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